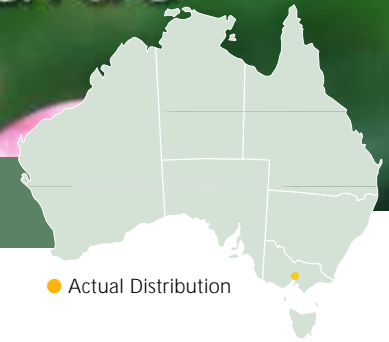


This document was originally published on the website of the CRC for Australian Weed Management, which was wound up in 2008.

To preserve the technical information it contains, the department is republishing this document. Due to limitations in the CRC's production process, however, its content may not be accessible for all users. Please contact the department's Weed Management Unit if you require more assistance.

Weed Management Guide

Lobed needle grass
Nassella charruana



● Actual Distribution

Lobed needle grass (*Nassella charruana*)

The problem

Lobed needle grass is on the *Alert List for Environmental Weeds*, a list of 28 non-native plants that threaten biodiversity and cause other environmental damage. Although only in the early stages of establishment, these weeds have the potential to seriously degrade Australia's ecosystems.

Even in its native Argentina, where the relatively unpalatable serrated tussock and Chilean needle grass are used as fodder, lobed needle grass is regarded as a serious weed due to its invasiveness and competitiveness. It is drought tolerant and forms dense infestations. While cattle may be able to tolerate lobed needle grass, it is a major problem for sheep because the sharp seeds can damage skins and carcasses and contaminate fleeces.

Lobed needle grass is closely related to serrated tussock (*Nassella trichotoma*), a Weed of National Significance which costs southeastern Australia's grazing industries more than \$40 million a year in control expenditure and lost production.

The weed

Lobed needle grass is a type of spear grass. It is a perennial tussock-forming grass growing to about 1 m high. The leaves are narrow and rolled inwards and, like other tussock grasses, grow



Lobed needle grass is a successful competitor with native grasses but has no nutritional value. Infestation in grazing areas would result in a significant loss in livestock production.
Photo: David McLaren

from the plant base. The leaves possess a short (1 mm) transparent 'ligule', which is a small flap at the junction of the leaf blade and the leaf sheath. The ligule can be located by tracing a leaf down to where it joins the sheath and bending the leaf back at this point.

It has a single flower on each spikelet enclosed by two distinctive lobes. The body of the seed is 4–10 mm long and less than 1 mm wide. The bristle-like tail of the seed (the 'awn') is 45–85 mm long and well connected to the seed body at the 'corona', which is a long (up to 10 mm) white collar at the seed base.

Key points

- Prevention and early intervention are the most cost-effective forms of weed control.
- Lobed needle grass forms dense infestations which exclude other more desirable species.
- It is unpalatable to stock.
- It has very sharp seeds which are easily spread by attaching to clothing, fur or machinery.
- In Australia it is limited to a few small infestations on the northern outskirts of Melbourne but it may easily spread without continued vigilance.
- Contact your state or territory weed management agency or local council if you find lobed needle grass. Do not attempt control on your own.

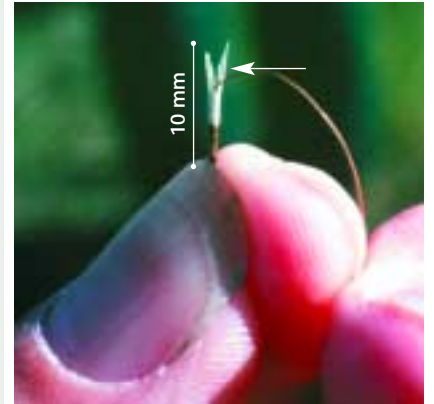


Growth calendar

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering												
Seed formation												
Seed drop												
Plant growth												
Germination												

■ General growth pattern ■ Growth pattern under suitable conditions

Lobed needle grass mainly flowers from mid-spring to early summer. Seed is formed and drops throughout summer and early autumn. Most vegetative plant growth and seed germination occur from autumn to winter, although some germination may occur year round under suitable conditions.



The seed of lobed needle grass has a long bristle-like tail.

Photo: David McLaren

How it spreads

Lobed needle grass reproduces by seeds. Although the exact amount of seed produced is not known, both of the closely related species serrated tussock (*N. trichotoma*) and Chilean needle grass (*N. neesiana*) can produce tens of thousands of seeds per plant per year. The seeds are very sharp and clinging, and readily attach themselves to clothing, fur and equipment. Seeds can also be spread when soil is moved. Major roadworks near the site of one infestation led to the spread of lobed needle grass.

Anecdotal evidence suggests that the seed is not carried by wind like serrated tussock.

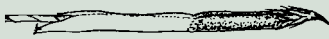


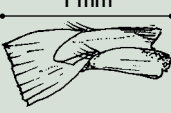
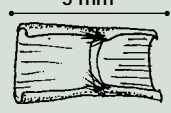
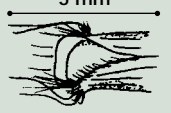
Where it grows

Lobed needle grass is native to Uruguay, Argentina and southeastern Brazil. Its known distribution in Australia is limited to a few small infestations on the northern outskirts of Melbourne – it has been recorded from Thomastown, Plenty Gorge Metropolitan Park and near Cooper Street in Epping, where it is thought to have been present for more than 40 years.

Stipoid grasses (such as the *Nassella* species) generally invade sites that are already highly degraded with a history of disturbance, especially land with higher fertility soil that has been used for grazing or farming.

Lobed needle grass has invaded open woodlands and native and introduced grasslands including grassland dominated by four other *Nassella* species. It grows mainly in open areas, in direct sunlight or light shade, on clay soils – its preferred soil type in South America. It is tolerant to waterlogging and appears to prefer wet depressions, but it also occurs on stony rises.

Grasses Identification

Species	<i>Nassella charruana</i> lobed needle grass	<i>Nassella hyalina</i> cane needle grass	<i>Nassella leucotricha</i> Texas needle grass
Status	introduced, an Alert List weed	introduced, an Alert List weed	introduced
Form	tussock	tussock	tussock
Seed (note in these images that the outer casing of the seed, the 'glume', has been removed to reveal seed detail)	10 mm 	10 mm 	10 mm 
'Corona', the collar at seed base	present	present	present
'Awn', the bristle-like seed tail	45–85 mm double bent firmly fixed to seed coat	35–40 mm twisted and bent	35–60 mm long, bent twice with 10–20 mm to first bend
'Cleistogenes', or stem seeds	absent	present	present
'Ligule', the flap at the leaf base	1 mm  few short hairs	5 mm  few short hairs	5 mm  many short hairs
Overall dimensions	0.5–1.0 m and 0.3–0.5 m across	to 1 m high, to 0.3 m across	1–1.5 m high, 0.2–0.5 m across

Why we need to be 'alert' to lobed needle grass

Lobed needle grass is a successful competitor with native grasses. It is already a problem in native grassland and poses a threat to biodiversity. It has no nutritional value as a stockfeed and, as has been seen with the closely related Weed of National Significance species serrated tussock (*N. trichotoma*) and Chilean needle grass (*Nassella neesiana*), infestations would result in a significant loss in livestock production.

Based on climate suitability, the potential distribution of lobed needle grass in Australia has been estimated at 600,000 ha.

There are at least 11 species of South American grasses naturalised in south-eastern Australia, collectively known as the 'South American stipoid grasses', which represent a significant threat to Australia's ecosystems.

As well as serrated tussock and Chilean needle grass, which are regarded as among the worst weeds in the country, two other species of *Nassella* are naturalised in Australia: the *Alert List*

Identifying lobed needle grass

Lobed needle grass is hard to identify because of its similarity to native spear grasses (*Austrostipa* species) and other *Nassella* species. They all have sharp seeds with a long curved or bent awn and hairy tip. However, *Nassella* species have strongly overlapping margins of the 'lemma' (the seed coat), which make it difficult to open the mature seeds. Also, the seeds of most *Nassella* species (except serrated tussock) possess a corona, a raised crown at the joining of the seed body and the tail (the awn). The corona is absent in *Austrostipa* species.

In lobed needle grass the corona is much longer than in most other *Nassella* species and is about equal to the length of the seed body (ie 10 mm). It consists of two pale-brown to white lobes, hence the common name. If not in seed, the ligule can be used to assist in identifying lobed needle grass. It is short (1 mm), transparent and possesses a few short hairs. See the grasses identification table below for further assistance in distinguishing between lobed needle grass and other species.

for *Environmental Weeds* species cane needle grass (*N. hyalina*) and Texas needle grass (*N. leucotricha*). Another related species, Uruguayan rice grass (*Piptochaetium montevidense*), is also on the *Alert List for Environmental Weeds*.






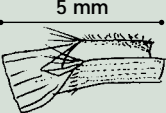
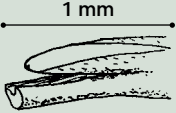
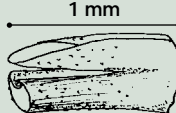
What to do about it

Prevention is better than the cure

As with all weed management, prevention is better and more cost-



Lobed needle grass is a perennial tussock-forming grass that forms dense infestations. Photo: David McLaren

<i>Nassella neesiana</i> Chilean needle grass	<i>Nassella trichotoma</i> serrated tussock	<i>Piptochaetium montevidense</i> Uruguayan rice grass	<i>Austrostipa</i> species spear grasses
introduced, Weed of National Significance	introduced, Weed of National Significance	introduced, an Alert List weed	native
tussock	tussock	tussock	single stems
10 mm	2 mm	2 mm	
			absent
present	absent	present	absent
60–90 mm double bent	25–35 mm straight or double bent firmly fixed to seed coat	10 mm straight readily detached from seed coat	greater than 20 mm straight
present	absent	absent	absent
5 mm	1 mm	1 mm	
			generally few short hairs
few long hairs	hairless	hairless	
1–1.5 m high and 0.3–0.6 m across	to 1.0 m high and to 0.6 m across	to 0.5 m high and to 0.2 m across	unknown

Weed control contacts

State / Territory	Department	Phone	Email	Website
ACT	Environment ACT	(02) 6207 9777	EnvironmentACT@act.gov.au	www.environment.act.gov.au
NSW	NSW Agriculture	1800 680 244	weeds@agric.nsw.gov.au	www.agric.nsw.gov.au
NT	Dept of Natural Resources, Environment and the Arts	(08) 8999 4567	weedinfo.nreta@nt.gov.au	www.nt.gov.au
Qld	Dept of Natural Resources and Mines	(07) 3896 3111	enquiries@nrm.qld.gov.au	www.nrm.qld.gov.au
SA	Dept of Water, Land and Biodiversity Conservation	(08) 8303 9500	apc@saugov.sa.gov.au	www.dwlbc.sa.gov.au
Tas	Dept of Primary Industries, Water and Environment	1300 368 550	Weeds.Enquiries@dpiwe.tas.gov.au	www.dpiwe.tas.gov.au
Vic	Dept of Primary Industries/Dept of Sustainability and Environment	136 186	customer.service@dpi.vic.gov.au	www.dpi.vic.gov.au www.dse.vic.gov.au
WA	Dept of Agriculture	(08) 9368 3333	enquiries@agric.wa.gov.au	www.agric.wa.gov.au

The above contacts can offer advice on weed control in your state or territory. If using herbicides always read the label and follow instructions carefully. Particular care should be taken when using herbicides near waterways because rainfall running off the land into waterways can carry herbicides with it. Permits from state or territory Environment Protection Authorities may be required if herbicides are to be sprayed on riverbanks.

effective than control. The annual cost of weeds to agriculture in Australia, in terms of decreased productivity and management costs, is conservatively estimated at \$4 billion. Environmental impacts are also significant and lead to a loss of biodiversity. To limit escalation of these impacts, it is vital to prevent further introduction of new weed

species, such as lobed needle grass, into uninfested natural ecosystems.

Early detection and eradication are also important to prevent infestations of lobed needle grass. Small infestations can be easily eradicated if they are detected early but an ongoing commitment is needed to ensure new infestations do not establish.

Quarantine to prevent further introductions

Quarantine laws require that, before the Australian Quarantine and Inspection Service (AQIS) could consider applications to import lobed needle grass, a comprehensive weed risk assessment would need to be conducted by Plant

The Alert List for Environmental Weeds

The Federal Government's *Alert List for Environmental Weeds* was declared in 2001. It consists of 28 weed species that currently have limited distributions but potentially could cause significant damage. The following weed species are therefore targeted for eradication:

Scientific name	Common name	Scientific name	Common name
<i>Acacia catechu</i> var. <i>sundra</i>	cutch tree	<i>Koelreuteria elegans</i> spp. <i>formosana</i>	Chinese rain tree
<i>Acacia karroo</i>	Karoo thorn	<i>Lachenalia reflexa</i>	yellow soldier
<i>Asystasia gangetica</i> ssp. <i>micrantha</i>	Chinese violet	<i>Lagarosiphon major</i>	lagarosiphon
<i>Barleria prionitis</i>	barleria	<i>Nassella charruana</i>	lobed needle grass
<i>Bassia scoparia</i>	kochia	<i>Nassella hyalina</i>	cane needle grass
<i>Calluna vulgaris</i>	heather	<i>Pelargonium alchemilloides</i>	garden geranium
<i>Chromolaena odorata</i>	Siam weed	<i>Pereskia aculeata</i>	leaf cactus
<i>Cynoglossum creticum</i>	blue hound's tongue	<i>Piptochaetium montevidense</i>	Uruguayan rice grass
<i>Cyperus teneristolon</i>	cyperus	<i>Praxelis clematidea</i>	praxelis
<i>Cytisus multiflorus</i>	white Spanish broom	<i>Retama raetam</i>	white weeping broom
<i>Dittrichia viscosa</i>	false yellowhead	<i>Senecio glastifolius</i>	holly leaved senecio
<i>Equisetum</i> spp.	horsetail species	<i>Thunbergia laurifolia</i>	laurel clock vine
<i>Gymnocoronis spilanthoides</i>	Senegal tea plant	<i>Tipuana tipu</i>	rosewood
<i>Hieracium aurantiacum</i>	orange hawkweed	<i>Trianoptiles solitaria</i>	subterranean Cape sedge



Biosecurity Australia. Considering its potential impacts on agriculture and the environment, it is unlikely that permission to import this plant would be granted.

Do not buy seeds via the internet or from mail order catalogues unless you check with quarantine first and can be sure that they are free of weeds like lobed needle grass. Call 1800 803 006 or see the AQIS import conditions database <www.aqis.gov.au/icon>.

Also, take care when travelling overseas that you do not choose souvenirs made from or containing seeds, or bring back seeds attached to hiking or camping equipment. Report any breaches of quarantine you see to AQIS.

Raising community awareness

It is not known exactly how lobed needle grass was first introduced into Australia. Most recently naturalised weeds (some 65%) are species that were first introduced into gardens and parks and have since escaped. A comparatively small percentage of weeds first arrived

as agricultural species (7%) or seed contaminants (2%).

The detrimental impacts of weeds when they escape cultivation invariably outweigh the horticultural benefits. The public should be made more aware of these impacts, and other issues such as how to identify lobed needle grass and what to do if they find it. For help in identification, see the box on page 3 and the grasses identification table on pages 2–3.

New infestations of lobed needle grass

Because there are relatively few lobed needle grass infestations, and it can potentially be eradicated before it becomes established, any new outbreaks should be reported immediately to your state or territory weed management agency or local council. Do not try to control lobed needle grass without their expert assistance. Control effort that is poorly performed or not followed up can actually help spread the weed and worsen the problem.

Legislation

Lobed needle grass has been declared a State Prohibited Weed by the Victorian Government. It is therefore illegal to import it into that state and it must be reported if found. In other states or territories there is currently no legislation to control lobed needle grass but, as part of the *Alert List for Environmental Weeds*, it is marked for eradication and should not be imported into Australia or further spread.

Acknowledgments

Information and guide revision: David McLaren (DPI Vic/Weeds CRC), Linda Iaconis (DPI Vic), Neville Walsh (Vic Herbarium) and John Thorp (National Weeds Management Facilitator), David Cooke (APCC).

Maps: Data used in the compilation of distribution map provided by Australian herbaria via Australia's Virtual Herbarium.

...case study

Eradication attempts north of Melbourne, Victoria

Lobed needle grass was identified on a rural property in the Epping area, 20 km to the north of Melbourne, in the 1990s. The property has been farmed by the same family since 1951 and the landholder, Peter Haberfield, believes that an infestation of lobed needle grass has been there since the 1950s. He recognises it because it is a difficult grass to slash.

The infestation has been gradually spreading over the years, especially since the mid 1970s when sheep were removed from the property and cattle introduced. Evidence from landholders suggests that while older cattle may eat lobed needle grass, younger cattle ignore it.

The infestation has extended to an adjoining disused quarry and the total area infested on the two properties is

about 15 ha. Lobed needle grass appears to grow best on the wetter parts of the property, on sites which are seasonally waterlogged. It is found in close association with cane needle grass (*N. hyalina*), another species on the *Alert List for Environmental Weeds*.

Another contributor to the spread of the weed appears to be soil disturbance that occurred when a gas pipe was laid through the area in 1975. A new infestation established on a nearby property is apparently associated with the gas pipeline.

A nearby infestation at Thomastown is directly in line with planned roadworks for a major bypass road entering Melbourne from the north. As part of an eradication program commencing in 1998, the infestation was sprayed before

the work began and contaminated soil was stockpiled at a special site to enable control of regrowth. The road contractor was instructed to implement a vehicle hygiene program to prevent the spread of lobed needle grass and other South American stipoid weed grasses also found at the site, including Chilean needle grass (*N. neesiana*), serrated tussock (*N. trichotoma*), Texas needle grass (*N. leucotricha*) and cane needle grass (*N. hyalina*).

A detailed survey and community awareness program was implemented when the grass was in flower and easy to identify. Ongoing follow-up control and the maintenance of a good cover of native or more desirable pasture grasses will be required at all sites to ensure that the lobed needle grass does not re-establish.



If you find a plant that may be lobed needle grass

Quick reference guide

Identification

You will first need to confirm its identity. Contact your state or territory weed management agency for help in identifying the plant. You will need to take note of the characteristics of the plant in order to accurately describe it. Some important features of lobed needle grass are:

- two lobes surrounding the seed head
- unbranched flower stems about 1 m tall
- a shimmering effect when in flower
- like other tussock grasses, leaves that grow from the base of the plant. They are narrow and rolled inwards.

- At the junction of the leaf sheath and blade most grasses have a small flap known as a ligule, which can be used to identify many of the tussock grasses. Lobed needle grass has a short membranous ligule (see the grasses identification table, pages 2–3).

For more information on how to identify *Nassella* grasses, see the information box on page 3 and the grasses identification table on pages 2–3.

Reporting occurrences

Once identified, new occurrences of lobed needle grass should be reported

to the relevant state or territory weed management agency or local council, who will offer advice and assistance on its control. Because lobed needle grass spreads so easily and poses such a serious threat, its control should be undertaken with the appropriate expertise and adequate resources.

Follow-up work will be required

Once the initial infestation is controlled, follow-up monitoring and control will be required to ensure that reinfestation from the seedbank does not occur.

Collecting specimens

State or territory herbaria can also identify plants from good specimens. These organisations can provide advice on how to collect and preserve specimens.

State/Territory	Postal Address	Phone	Web
Australian National Herbarium	GPO Box 1600 Canberra, ACT, 2601	(02) 6246 5108	www.anbg.gov.au/cpbr/herbarium/index.html
National Herbarium of New South Wales	Mrs Macquaries Rd Sydney, NSW, 2000	(02) 9231 8111	www.rbg Syd.nsw.gov.au
National Herbarium of Victoria	Private Bag 2000 Birdwood Avenue South Yarra, Vic, 3141	(03) 9252 2300	www.rbg.vic.gov.au/biodiversity/herbarium.html
Northern Territory Herbarium	PO Box 496 Palmerston, NT, 0831	(08) 8999 4516	http://www.nt.gov.au/ipe/pwcnt/
Queensland Herbarium	c/- Brisbane Botanic Gardens Mt Coot-tha Rd Toowong, Qld, 4066	(07) 3896 9326	www.env.qld.gov.au/environment/science/herbarium
South Australian Plant Biodiversity Centre	PO Box 2732 Kent Town, SA, 5071	(08) 8222 9311	www.flora.sa.gov.au/index.html
Tasmanian Herbarium	Private Bag 4 Hobart, Tas, 7000	(03) 6226 2635	www.tmag.tas.gov.au/Herbarium/Herbarium2.htm
Western Australian Herbarium	Locked Bag 104 Bentley DC, WA, 6983	(08) 9334 0500	http://science.calm.wa.gov.au/herbarium/

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